

User Guide

Lubricus Lubrication System **LUB-D1/LUB-D2/LUB-D3/LUB-D4**

(24 VDC)



Content

General Information	3
Warning	3
Scope of Supply	3
Overview	3
General safety details	4
Intended use	4
Extent of warranty	4
General safety information	4
Transport and storage	6
Function /Principle	7
Communication Interface, Connector PIN assignment	7
Installation instruction/ Pulse signals details	8
Functional problems: error, message and problems	9
Service: replacement of cartridge	9
Technical Data	11
Recommended tube length	11
Mounting	12
Disposal	12

General Information

Thank you very much deciding to use Lubricus Lubrication System. Make sure that you familiarize yourself with the safety instructions of Lubricus Lubrication System and the accessories supplied with this unit. This manual contains important safety information.

The Lubricus Lubrication System is a very compact lubrication pump for oil and grease up to NLGI 2. The pump requires 24 VDC power supply. The lubricant reservoir (400 cm³) is contained in cartridge. Supply pressure is up to 70 bar (1,000 psi). The Lubricus Lubrication System Type D is available with up to 4 outlets.

Warning

Lubricus Lubrication System is designed for use in normal industrial environment indoor as well as outdoor but is not suitable for mounting on moving equipment for example trucks. Only use original Lubricus cartridge and original spare parts. None original spare parts can destroy the Lubricus Lubrication System.

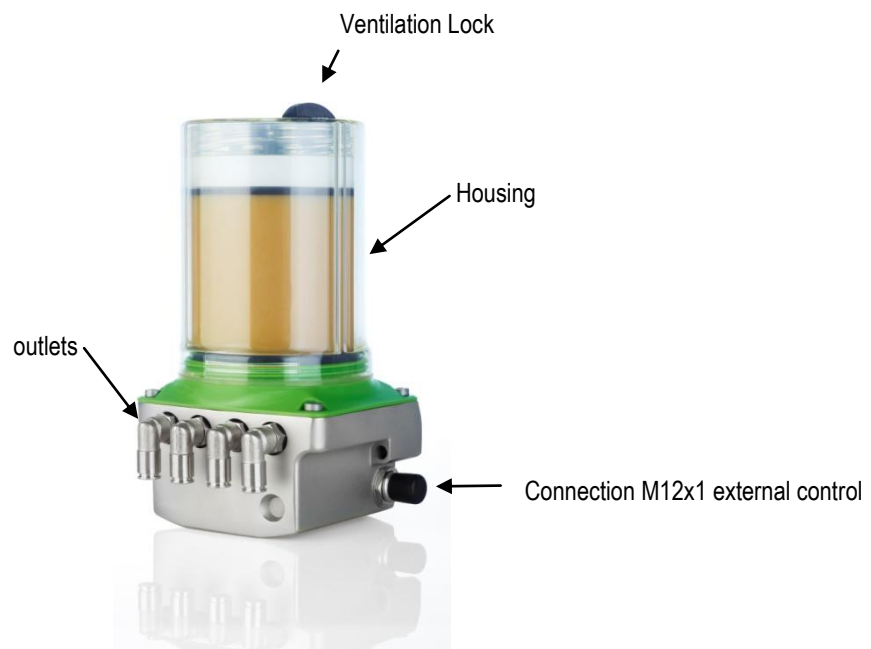
Scope of supply

Standard delivery includes:

- Lubricus Lubrication System
- Tube connector attaches to the outlet, suitable for flexible tube 6 x 4
- (Ø 6mm outside and Ø 4mm inside diameter),
- Operating Instructions

Overview

The setup of your - Lubricus Lubrication System is easy. This user manual will learn you the basic operation and adjustments.



Important remark: unused outlets must remain open to avoid damage to the pump!

General safety details

Everybody who is involved with the installation, start-up, maintenance and operation of the Lubricus Lubrication System must read these instructions carefully!

Use in accordance with guide

Attention!

Lubricus Lubrication System is **only** allowed for **industrial use**.

Lubricus Lubrication System may only be put into service, if it is integrated or attached to another machine and will be operated together with that machine.

Lubricus Lubrication System may only be used according to the technical data (see chapter "technical data")

Unauthorized **structural changes** at the Lubricus Lubrication System are **not permitted**. We do not assume liability for damages of persons or machines which result from that.

Additional directives for use in accordance with the regulations:

- Pay attention to all notes in the operator's manual / user guide.
- Carry out all maintenance work.
- **Follow** all appropriate regulations for the **work safety** and **accident prevention** during life of the Lubricus Lubrication System.
- Only qualified and authorized personnel can carry out required work on the Lubricus Lubrication System.

Attention!

Other uses or uses beyond those described above cannot be considered to be in accordance with the regulations.

Extent of warranty

Warranties concerning operating safety, reliability and capacity, are only granted under the following conditions:
Assembly, installation, maintenance and repair are only carried out through trained specialist. Hazardous hot or cold machine parts must be shielded to prevent touching.

-The Lubricus Lubrication System must be used according to the instructions in the technical operating manual

-The rated technical data must not be exceeded in any case.

-Retrofitting and repair work on the Lubricus Lubrication System may only be done by the manufacturer.

General safety information

Basic information, which must be followed during service, operation and maintenance, are listed as follows.

It is absolutely essential to read the operator's manual / user guide by respective technical staff / technical operator before installation and start up. In addition to this, it must be permanently available at the site.

IMPORTANT

Please pay attention, not only to the safety instructions under this main point, but also to those special security cautions that are mentioned on the other pages.



This symbol warns of electrical voltage.



This symbol warns of electrical voltage.

Attention!

This heading is used if inaccurate compliance or non-compliance with the operating Instructions or specified work procedures etc. may result in damage.

Remark!

Points out special information.

Notes attached directly on the machine, must be strictly followed and maintained in completely readable condition!

Qualification and training of the personnel

The operation, maintenance, service and installation personnel must have appropriate qualifications for this work. Responsibility and supervision of the personnel must be clearly defined by the end user / operator. If the personnel do not have the necessary knowledge, they must be trained and instructed. The operator must ensure that the personnel have completely understood the contents of the user information.

Non-observance of the safety information can be dangerous

Not observing the safety information can lead to danger for people, environment and machines. Not observing the safety information can mean the loss of any or all damage claims. In special cases, non-observance can, for example, lead to the following dangers:

- Failure of important plant functions.
- Failure of prescribed methods of maintenance and preventive maintenance.
- Endangering people due to electrical, mechanical and chemical effects.
- Endangering the environment due to leaks of dangerous materials.

Safety information for operators/operating staff

- Hot or cold machine parts are hazardous and must be protected from touching. The protection on "moving or rotating parts" must not be removed.
- In case of leakages of dangerous media proper disposal not endangering environment and people must be ensured.
- Legal Regulation must be observed and complied.
Eliminate any danger due to electrical power.

Safety information for maintenance, inspection and assembly work

All **maintenance, inspection and installation work** may only be carried out **by trained specialists** who have been informed appropriately by studying the user information closely.

All work must only be carried out when **machine is shut down** and while wearing appropriate **protective clothing**. Always comply with the procedures for shutting the machine down that are described in the operating manual. All the safety and protective equipment must be replaced immediately after completing work. Environmentally hazardous substances that endanger the environment must be disposed in accordance with local regulations. Secure the system during maintenance and repair work, against intentional or unintentional operation. Dispose of used lubricants in accordance with the safety data sheets of the lubricant manufacturer.

Alterations and manufacture of spare parts without authority

Rebuilding or altering the Lubricus Lubrication System is only allowed after consultation with the manufacturer. **Original spare parts** and accessories authorized by the manufacturer are for **safety** purposes. Using other parts results in loss of liability for claims resulting out of this. For components, retrofitted by the operator, the manufacturer does not assume guarantee nor claims for damages.

Prohibited methods of operation

Operational security of the Lubricus Lubrication System is only guaranteed if it **is operated in accordance with the operating instructions**. The limit values stated in the technical data must not be exceeded under any circumstances.

General risk reference



All components of the system are designed in accordance with the prevailing regulations of the construction of technical machines, in regards to operational safety and accident prevention. Operation outside of these constraints can lead to dangers for the user respectively third persons or other technical facilities. The Lubricus Lubrication System therefore may fulfil only in **technically fault-free condition** its intended use. This may only be carried out under compliance of the safety regulations and the attention of the operator's manual.

Therefore please **regularly inspect** the pump and its attachments for possible **damage** or **leaks**.

Transport and storage

Use suitable lifting gear for transport.

Do not throw or expose the Lubricus Lubrication System to strong shock loads.

Store the Lubricus Lubrication System in a cool and dry place to avoid corrosion of the system's individual parts.



Pay attention to the current safety- and accident prevention instructions during the transport. Wear suitable protection equipment if necessary!

Installation instruction



The following conditions have to be satisfied during the installation of this Lubricus Lubrication System, thus it can be assembled, with other parts, to a complete machine without affecting the safety and health of humans.

The housing of Lubricus should not be exposed to direct sunlight and/or radiant heat preventing the formation of condensation.

Electrical connection



- Have the electric power supply connected only by a trained electrician!
- Connection and wiring of the electric components should be done by an expert trained in this field.
- Check the voltage details with the existing power supply voltage!

Maintenance /repair



Disconnect the voltage feed, before starting with **maintenance or repair**.

Maintenance and repair work may only be done with the system shut down.

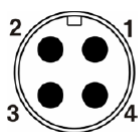
Check the surface temperature of Lubricus Lubrication System, due to danger of burning by radiant heat. Always wear heat-resistance gloves! Protect the system from activation during maintenance and repair work!

Function/Principle

When you activate Lubricus, Type D, the piston pump starts to work and pump the lubricant in small quantities to the outlets. The integrated microprocessor controls the function. Communication with the machine controller is necessary. Delivery rates and time between the lubrication intervals can be individually set by pulse signals.

The Lubricus Lubrication System uses a four-pin socket to connect a M12X1 plug allowing communication with the machine controller. An external 24 VDC power supply is used to switch ON and OFF (voltage of +20 ...up to +30 VDC, supplied to PIN 1). When voltage is supplied the lubrication pump is in operating condition. If there are no errors (Pump OK) the input voltage will be transferred to the output signal (PIN 4) indicating all is OK. Once the voltage supply to PIN 1 is stopped (switched OFF), the pump rests and saves the current operating conditions in memory. When the pump is turned back on the saved operating conditions will be continued. PIN 4 relays the operating condition.

Connector PIN assignment, connection to Lubricus, Type D



Connector PIN assignment M 12 x 1

- PIN 1: input voltage +20...30 VDC, color brown
- PIN 2: activation of the individual pump outlets. color white
- PIN 3: Ground (GND), color blue
- PIN 4: Output Signal, color black

Details:

Peak current I_{max} (during pump operation) approx. 350 mA, typically < 200 mA, Standby current (standby mode) < 20 mA

Output signal PIN 4: High (+20...30 VDC) = OK
Low = 0 V = Error (empty signal, over current)

The outlet signal, PIN4, can be charged with maximal 300mA. Warning: the exit is not short-circuit proof

A time delay fuse 1A is normally required.

Output signal: in case of empty lubricant reservoir: PIN 4 generates an alternating high and low signal, switching with 0,5 Hz.

Pump function control: after receiving a correct pulse signal at PIN 2, the pump starts to work. During the function of the pump (about 7s) the output signal at PIN 4 is switching from High (+ 20...30 VDC) to Low (0 V). By counting the signals of the pump function control there is a possibility to estimate the delivered quantity of lubricant and the remaining quantity in the lubricant reservoir (delivery rate per pulse signal = 0,15 cm³).

Installation and commissioning

Identification of the pump outlets

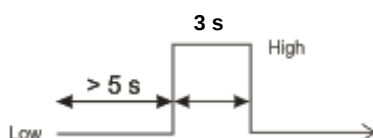


Pulse signal details (Indication in seconds, accuracy +/- 10%)

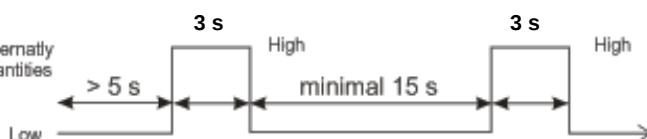
-delivery rate per pulse signal: 0,15 cm³ (one outlet)

-time between two pulse signals: minimum 15 s

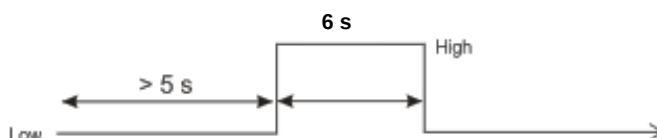
- activate 1.1



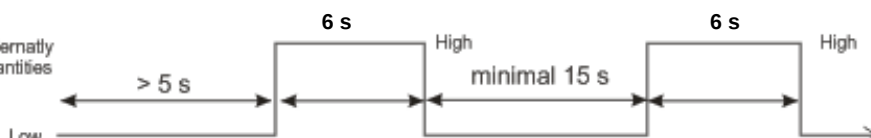
- activate 1.1 + 1.2
(outlets will be served alternately and dispensed equal quantities from both outlets)



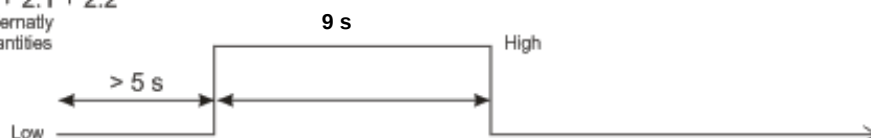
- activate 2.1



- activate 2.1 + 2.2
(outlets will be served alternately and dispensed equal quantities from both outlets)



- activate 1.1 + 1.2 + 2.1 + 2.2
(outlets will be served alternately and dispensed equal quantities from all outlets)



Functional problems

Error messages / faults: The dedicated error message is given to PIN 4

E1: Empty lubricant reservoir

PIN 4 generates an alternating high and low signal, switching with 0,5 Hz.

Root cause: lubricant cartridge is empty.
The pump will stop!

Corrective action: replace cartridge.
Pump will continue to run as per active program

E2: Back pressure too high / over-current:

Output Signal = Low

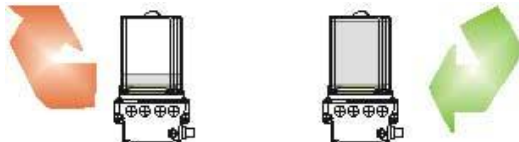
Root cause: Back pressure was measured 3 x too high. The lubrication point could be clogged, the tube length could be too long or the grease is too stiff or has hardened. The pump will stop!

Corrective action: Trace reason for high back pressure >70bar and correct it.

Switch unit „OFF“ and „On“ again. The error message will be reset to 0. The pump will start again as per program in memory.

System error: Switch unit „OFF“ and „On“ again, Memory will not be erased.

Service: replacement of cartridge



Any further service is not necessary.

1. Observe the safety instructions. Switch off the pump: Display – report „OFF“



2. Take out ventilation locking (turn clock wise to OPEN)



3. Press the housing, turn left and remove it



4. Remove the empty cartridge.



5. Remove protection from the new cartridge



6. Lubricate O-Ring of the new cartridge slightly.

7. Place the cartridge on the inlet



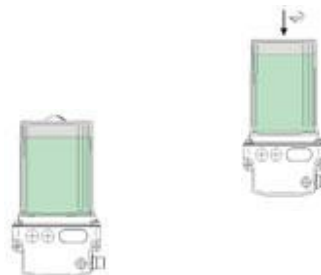
8. Place the pump upright on flat surface. Reinstall the housing gently pressing while turning clockwise until hand tight.



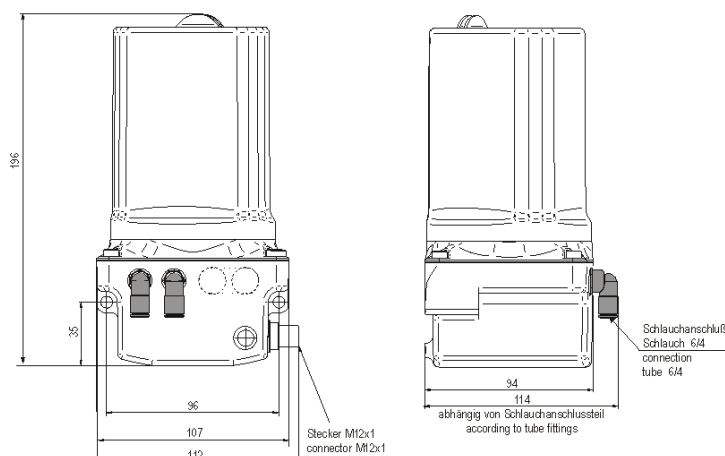
9. Install the ventilation lock and close it (turn counter clockwise to CLOSE)



10. Pump will work again according to settings, error report will be deleted



Technical Data



Storage/volume	cartridge 400cm ³ or max. 500ml oilreservoir
Lubricant	oil or grease up to NLGI 2
Function / principle	piston pump
Delivery rate per pulse signal	0,15 cm ³
Number of outlets	up to 4
Connection	high pressure tube 6 x 4 (flexible tube Ø 6mm outside and Ø 4mm inside)
Operating pressure	max. 70 bar
Operating temperature	-20°C to +70°C
Operating voltage	24 VDC
Dimensions, max.	Width x height x depth, 112 x 196 x 94 mm (without tube fitting)
Weight, without lubricant	ca. 1120g
Integrated Control	micro processor controlled
Pressure monitoring	integrated, electronic (monitoring backpressure)
Level monitoring	integrated, reedcontact
Connector	M12 x 1, 4-pole for connection with PLC
Protection class	IP 65 (= suitable for under water Operation up to 1 m)
Combination with progressive systems	possible

Recommended tube length

- Keep in mind:
- For low temperature
 - For stiff grease, more than NLGI 2
 - For difficult applications with high backpressure
 - ➔ Shorten your tube as much as possible
 - ➔ Minimum inner diameter is 4mm Ø
 - ➔ Avoid reductions of the inner tube

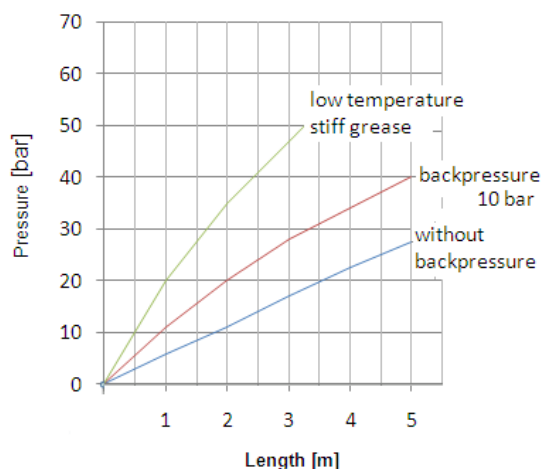
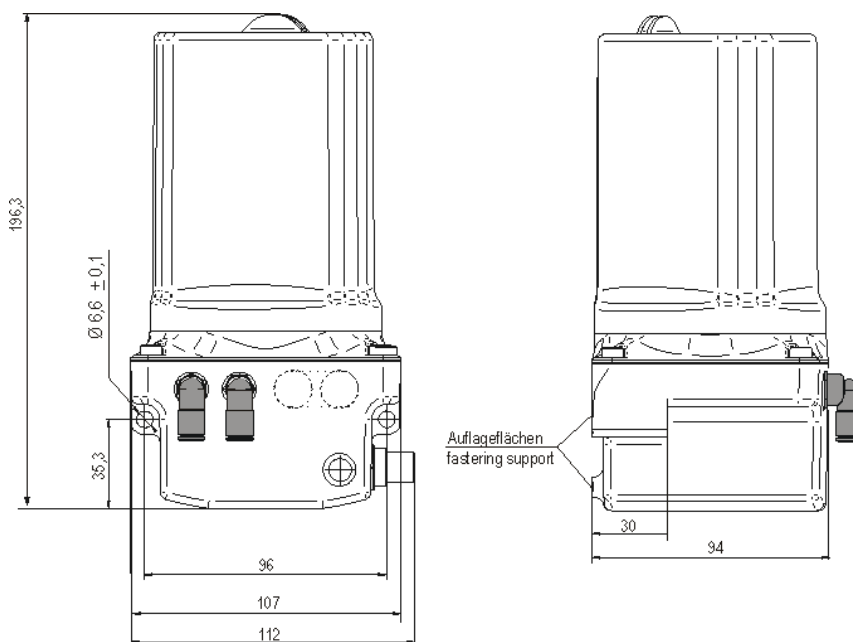


Chart: Required pressure vs. tube length (tested with tubes 6 x 4 mm)

Mounting FlexxPump

2 screws $\varnothing 6\text{mm}$, for example M6x40 are required for a safe installation of your FlexxPump. The optimum tightening torque of the screw is 5 Nm. 3 points at the back assure a safe support.



Disposal

Remark !

When disposing lubricant the waste disposal instructions of the lubricant manufacturer must be observed!

Disposal of Lubricus Lubrication System: observe the regional valid laws and regulations.

The empty lubricant cartridges contain lubricant remains!
Please dispose with other oil contaminated garbage!

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